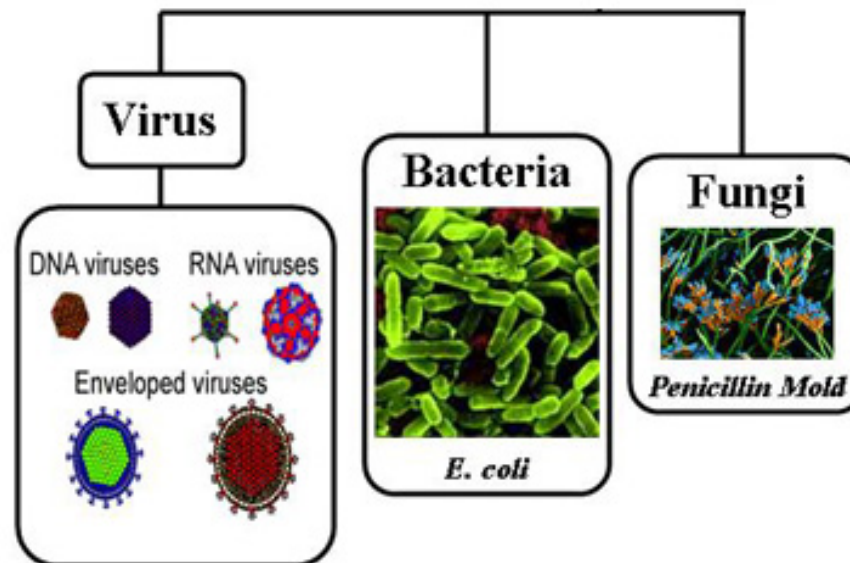


19 - Microbiology and Biotechnology

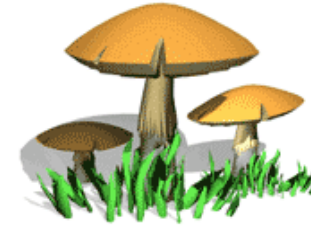
Micro-organisms are **tiny** and measured in nanometres. Some examples of these are fungi, bacteria and viruses.



It's important to note that **Viruses are not living** things. They are not made of cells and cannot reproduce on their own. So they are all **parasites**.

Fungi

These are the largest type of microorganism.
Examples are bread mold, yeast and mushrooms.



They cannot make their own food and live off other things.
Some live off a live host while others live off dead things
(saphrophytes).



Benefits - decompose dead organisms and **recycle** nutrients.
Yeast makes **alcohol** and **breads**. We also eat **mushrooms**.
Antibiotics are made from the fungus **penicillin**.

Harmful fungi - Some fungi cause disease.
e.g. Ringworm and Athlete's foot.
They also cause food to rot, which costs money.

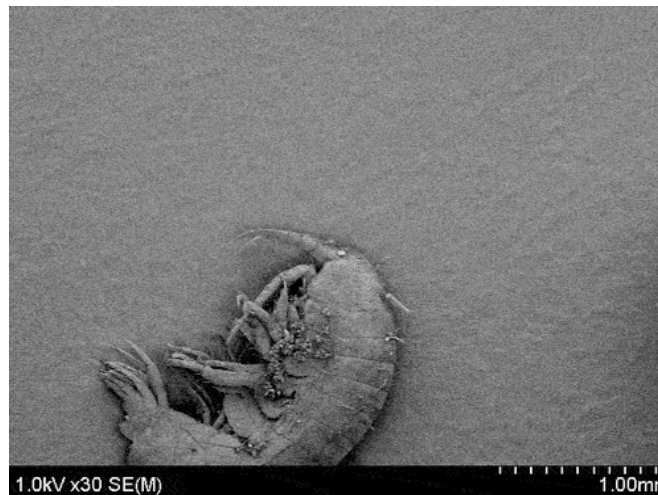


Bacteria

Bacteria are very small and can only be seen by microscope.

Benefits - decompose dead organisms and **recycle** nutrients.
They make antibiotics and also make yoghurts.

Harmful - Some bacteria cause disease,
e.g. tetanus and food poisoning.



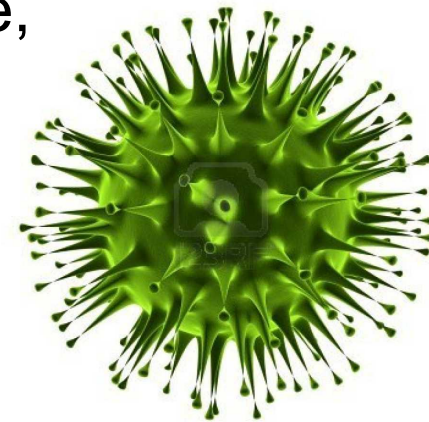


Viruses

Viruses - These are much smaller than bacteria and can only be seen with an electron microscope.

Benefits - These can be used to make vaccines.

Harmful - Some viruses cause disease, e.g. flu, chickenpox



Biotechnology

Biotechnology is the use of living things to make something useful.

Biotechnology in Industry

Yeast is used in bread and alcohol making.
Enzymes are used in washing powders.
They also make antibiotics and vaccines.

